REMARKS

Claims 1-20 are pending in the present application.

In the Office Action, claims 1-10 and 14-20 were rejected under 35 U.S.C. 103(a) as being unpatentable over Beisswenger et al. (U.S. Patent No. 4,716,856) in view of Lapple et al. (U.S. Patent No. 3,578,798). Claims 11-13 were rejected under 35 U.S.C. 103(a) as being unpatentable over Beisswenger et al. in view of Lapple et al. and further in view of Bresser et al. (U.S. Patent No. 5,560,762).

Claims 1, 13 and 14 have now been amended. Claim 20 has been cancelled. No new matter has been added. Reconsideration of the application in view of the above amendment and following remarks is respectfully requested.

Rejections to claims 1-10 and 14-20 under 35 U.S.C. §103(a)

Claims 1-10 and 14-20 were rejected under 35 U.S.C. 103(a) as being unpatentable over Beisswenger et al. (U.S. Patent No. 4,716,856) in view of Lapple et al. (U.S. Patent No. 3,578,798).

Beisswenger describes a fluidized bed system for burning carbonaceous fuel to provide steam by introducing fuel into a fluid bed in an upright reactor wherein the material is fluidized by a gas introduced at the bottom of the bed. See Beisswenger, column 1, lines 5-7 and column 2, lines 30-34.

Lapple describes a cyclonic fluid bed reactor including a tube 14 with passages 36 for the discharge of materials from the fluidized bed 33 into the tube 14 and vertically spaced rows of air inlets 25 to create a spiral movement in the tube 14. The solids discharged from the fluidized bed 33 through the passages 36 into the tube 14 are entrained, spiral upward into and are separated from the gas in the freeboard space 37, and are reintroduced into the fluidized bed 33 by gravity. See Lapple, the title, column 2, lines 12-19, 43-58 and 65-69, and Figs. 1 and 2.

Independent claim 1 of the present application recites "adjusting gas velocities of the first gas or gas mixture and the fluidizing gas for the stationary annular fluidized bed such that the

Particle-Froude-Number is a) in the at least one gas supply tube between 1 and 100, b) in the stationary annular fluidized bed between 0.02 and 2, and c) in the mixing chamber between 0.3 and 30."

It is respectfully submitted that neither Beisswenger nor Lapple teach or suggest adjusting gas velocities of the first gas or gas mixture and the fluidizing gas for the stationary annular fluidized bed such that the Particle-Froude-Number is a) in the at least one gas supply tube between 1 and 100, b) in the stationary annular fluidized bed between 0.02 and 2, and c) in the mixing chamber between 0.3 and 30., as recited in claim 1. In contrast, Beisswenger merely describes a typical Froude number range for a circulating fluidized bed reactor that may define overall reactor operating conditions. See Beisswenger, column 2, lines 48-69. Beisswenger nowhere teaches establishing differing Froude ranges in different portions of the chamber of an annular fluidized bed reactor, i.e., the gas supply line, annular fluidized bed and mixing chamber, as recited in claim 1. Nor does Beisswenger teach the combination of Froude number ranges recited in claim 1. Regarding Lapple, that reference does not teach Froude numbers at all. Lapple moreover recites an annular reactor. A person of ordinary skill in the art would therefore not have attempted to apply the Froude numbers of Beisswenger relating to circulating fluidized bed reactor to control the annular fluidized bed reactor of Lapple.

Because each of Beisswenger and Lapple are missing at least the recited differing Froude ranges feature recited in claim 1, it is respectfully submitted that any combination of Beisswenger and Lapple, to the extent proper, could not render claim 1 or any of its dependent claims obvious.

Moreover, Independent claim 1 of the present application has now been amended so as to recite introducing from below a first gas or gas mixture through at least one gas supply tube with an upper orifice into a mixing chamber of the fluidized-bed reactor "so as to entrain solids from a stationary annular fluidized bed into the mixing chamber when passing through the upper orifice" of the at least one gas supply tube, and that the "at least one gas supply tube is at least partly surrounded by a stationary annular fluidized bed extending beyond the upper orifice" of the gas supply tube. Similarly, dependent claim 14 has now been amended to be in independent form and to recite a first gas or gas mixture flowing through the at least one gas supply tube "entrains solids from the stationary annular fluidized bed into the mixing chamber when passing through the upper

orifice" and "wherein the stationary annular fluidized bed extends beyond the upper orifice" of the gas supply tube. Support for these amendments can be found in the Specification, for example, on page 1, first paragraph, page 3, lines 3-7, and page 8, line 28 to page 9, line 2, and in claim 20, which has now been cancelled.

It is respectfully submitted that neither Beisswenger nor Lapple teach or suggest entraining solids from a stationary annular fluidized bed into the mixing chamber by a first gas or gas mixture passing through an upper orifice of at least one gas supply tube where the supply tube is at least partly surrounded by the stationary annular fluidized bed extending beyond the upper orifice of the gas supply tube, as recited in claims 1 and 14. As discussed in the present specification, such an arrangement allows for the gas or gas mixture to entrain solids from the annular stationary fluidized bed into the mixing chamber. See Specification, page 3, lines 3-8. In contrast, Lapple describes an annular reactor where the tube 14 extends beyond the fluidized bed 17. See Lapple, Fig. 1. The extension of tube 14 beyond the fluidized bed 17 in Lapple prevents solids in the fluidized bed 17 from being entrained by the gas in tube 14. Lapple moreover teaches *away* from the claimed design by describing that its solids are only entrained by the gas after being discharged into tube 14 though tangentially arranged passages 36 in tube 14. See Lapple, column 2, lines 44-58, and Fig. 1. Regarding Beisswenger, that reference does not teach an annular fluidized bed reactor at all.

Because each of Beisswenger and Lapple are missing at least the recited stationary annular fluidized bed extending beyond the upper orifice of the gas supply tube feature recited in claims 1 and 14, it is respectfully submitted that any combination of Beisswenger and Lapple, to the extent proper, could not render claims 1 or 14, or any of their respective dependent claims, obvious.

For the above reasons, reconsideration and withdrawal of the rejection to claims 1-10 and 14-20 under 35 U.S.C: § 103(a) based on Beisswenger in view of Lapple is respectfully requested.

Rejections to claims 11-13 under 35 U.S.C. §103(a)

Claims 11-13 were rejected under 35 U.S.C. 103(a) as being unpatentable over Beisswenger et al. in view of Lapple et al. and further in view of Bresser et al. (U.S. Patent No. 5,560,762).

Beisswenger and Lapple are described above.

Bresser describes a process for the heat treatment of fine-grained iron ore in a circulating fluidized bed system for the conversion of the heat-treated iron ore to metallic iron in a conventional fluidized bed. See Bresser, column 1, liens 9-11 and column 2, lines 15-17 and 29-31.

It is respectfully submitted that claims 11-13 properly depend from claim 1. As stated above, Beisswenger and Lapple fail to teach and suggest at least the features of "adjusting gas velocities of the first gas or gas mixture and the fluidizing gas for the stationary annular fluidized bed such that the Particle-Froude-Number is a) in the at least one gas supply tube between 1 and 100, b) in the stationary annular fluidized bed between 0.02 and 2, and c) in the mixing chamber between 0.3 and 30," a reactor where "one gas supply tube is at least partly surrounded by a stationary annular fluidized bed extending beyond the upper orifice of the gas supply tube" and withdrawing iron ore and low-temperature coke from the reactor "through an upper duct together with the gas." Bresser does not cure this defect. Therefore, a combination of Beisswenger in view of Lapple and further in view of Bresser, to the extent proper, could not render claim 1 or its dependent claims 11-13 obvious.

For the above reason, reconsideration and withdrawal of the rejection of claims 11-13 under 35 U.S.C. § 103(a) based on Beisswenger in view of Lapple and further in view of Bresser is respectfully requested.

CONCLUSION

In view of the above amendments, applicant believes the pending application is in condition for allowance.

The Commissioner is hereby authorized to charge any unpaid fees deemed required in connection with this submission, including any additional filing or application processing fees required under 37 C.F.R. §1.16 or 1.17, or to credit any overpayment, to Deposit Account No. 04-0100.

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Respectfully submitted,

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